CONTINUOUS IMPROVEMENT PROJECT DATABASE

CYCLE TIME REDUCTION PROJECTS

Project Name	Project Description	Division	Project Year	Contact Name	Contact Number
ITS Site Survey & Rapid CCTV Survey	Conventional CCTV (Traffic Camera) Surveys require the use of a great deal of time, manpower and equipment. Bad weather, soft soil and the size of the truck limit the setup options available to the crew and lengthen the time required. This resulted in less than optimal images that had to be transferred to a computer for finishing touches. All of this was time consuming. A rapid CCTV system was developed using materials on the service truck the required no additional money. A telescopic height pole was fitted with a small CCTV test unit. The images were captured on a laptop computer using software developed in-house. The software captured and cataloged the images, allowing for quick processing and use. Images are immediately mailed from site to engineers. After the initial test site the unit was able to process four sites. A service truck was able to survey 18 sites in a day during rain with serious soft soil conditions in the survey zone. The data was processed in a quarter of the required time for a standard site survey.	Triad Transportation Management System	2009	Michael Venable	(336) 315-7080
Natural Resources Tech Report	The Natural Environment Unit (NEU) is responsible for overseeing the preparation of Natural Resource Technical Reports (NRTR). The NEU develops the standard templates for these documents so that in-house staff biologists and consultants can produce similar products. NEU sought ways to reduce the amount of time necessary to complete NRTR's to improve the cycle time for NEPA document preparation. A team of NEU biologists and managers was established to reevaluate the NRTR template. This team met several times to evaluate the various components of the document and decide what was truly necessary and what could be reduced or eliminated. Ultimately, the NRTR template was simplified to only those topics essential for compliance with NEPA requirements. The NRTR documents have been considerably streamlined. The text of a typical NRTR document has been reduced by over 50%, and a consistent format has been established for all deliverables. Increased efficiency in document preparation and review translates into man-hour savings, cost savings and reduction in cycle time for NRTR preparation in the NEPA process.	PDEA	2009	James Hauser	(919)431-6631
Adopt-A-Highway Web 3.0 Application	The Adopt-A-Highway (AAH) program was in need of an upgrade from its legacy mainframe system that would allow the program's 96 AAH coordinators and co-coordinators quick and accurate processing of new applications, as well as producing management reports and labels for more than 6,000 AAH groups. The legacy database was state of the art when it was designed in 1989. A Web-based AAH database and report system that integrates the mainframe legacy system and the IVR system was developed, resulting in improved efficiency in the workplace and improved customer service to AAH groups. AAH coordinators now use the most advanced AAH system in the nation. Applicants are now able to enter data using the web site, reducing the coordinator workload. Management reports may be sorted easily by various criteria, giving AAH coordinators time saving management tools. Searches for any group and researching pickup history is easily done and available more quickly. Pickup reports are available in real time and labels for groups may be printed locally. The new system saves 1778 labor hours annually.	Office of Beautification Program	2009	Tiffaney Crosby	(919)733-2920
Analytical Instrumentation Update	The Chemical Laboratory had an outdated X-ray instrument that was use to analyze Portland cement, fly ash, and metal alloys. Traditional wet chemistry methods, which provided more accuracy, were used to analyze materials that failed the X-ray test. The Chemical Laboratory is accredited by the Cement and Concrete Reference Laboratory (CCRL). The old unit was not capable of passing accreditation testing. Research determined that wavelength dispersive X-ray fluorescence (WDXRF) equipment would pass the stringent requirements of ASTM C-114 Standard Test Methods for Chemical Analysis of Hydraulic Cement. A new unit was purchased and placed in service allowing more accurate tests than with the old instrument and avoiding time consuming wet chemistry methods. The new unit streamlined many of the tests above and beyond expectations. It is accredited by CCRL for Portland cement testing and is used for proficiency sample testing of various grades of cement and fly ash materials. The new unit is capable of testing cement percentage in concrete cores, composition of slab zinc alloy, zinc dust, and identification of material for oxides. It reduced the need for many traditional wet chemistry tests performed by the laboratory and now saves approximately 1,594 labor hours annually.	Materials & Test	2009	Kelly Croft	(919)329-4090

Sign Rack	Traffic Services needed an organized way to transport highway signs in the sign trucks that would reduce the time it takes to access the right sign and protect the signs from damage caused by signs rubbing together. A sign rack made out of a 12 x 12 x 1 ½" piece of solid plastic with ¼ inch deep slots ¼ inch wide apart was fabricated. The new sign rack can be placed in the side storage areas of a sign truck. This enables the storage of 29 signs in a rotating rack. The new sign rack maintains an inventory of signs, protect signs from damage and make them readily accessible. The sign rack saves time by reducing the time it takes to access signs and retrieve needed signs.	Division 2 - Traffic Services	2009	Wesley Brazelton	
Reclamation of Calcium Chloride	Problem: During a snow and ice event we load our spreaders saddle tanks with 100 gallons of calcium chloride in order to pre-wet salt before application. The problem occurs when a storm event don't develop in the manner in which it was forecasted and we do not use the material we loaded onto the trucks. Traditionally our department has been able to unload unused salt back into its storage bins, but there is no way to unload hundreds of gallons of calcium chloride back into its original 5000 gallon storage tank directly from the trucks saddle tanks. Solution: Our solution to returning this unused material back to its original tank is to create an intermediate tank in which to drain the saddle tanks into. After the intermediate holding tank has been filled, the material can then be pumped mechanically back into its original 5000 gallons storage tank located at the salt brine plant. Results: At 0.63 cents per gallon there isn't much cost savings in reclaiming this material, however the benefits lie in not storing this corrosive material in our equipment or discharging this chemical all at once into the environment.	Newell Maintenance	2007	John Edmonds	(704) 596-5782
Ineffective Use of the Office SAP Document Scanner	Problem: When scanning documents we had been unaware that we were able to change the profile on the scanner from the default setting to a color setting. Using default for all documents was causing unreadable scans to end user (Raleigh Commercial Accounts). Due to this, it was taking us away from our desk to make additional copies of documents and having to make unnecessary calls to the vendor to make a request that they modify their invoices to suit our needs. Solution: When the appropriate profile is selected, it allows us (accounts payable clerks) to make a true copy of the document. Results: Saves time of going through trail and error to produce a copy that end users can read.	NCDOT, Division 10 Equipment	2007	Ricky R. Mabry	(704)-596-2131
Secondary Construction Right of way	Problem: In the past, we would survey a road, draw plans, and send to right o f way unit for R/W acquisition. After performing all of this work, property owners at times express their wishes to keep the road unpaved. If property owners do not dedicate right of way, the Department will not pave the road. In an effort to keep the road unpaved, the property owners advise that they are not going to sign right of way. Solution: See attached letter set out to property owners prior to surveying and drawing road plans. Property owners given opportunity to comment and express their wishes prior to commitment of department resources. Results: Less time spent on roads where right of way will not be granted and therefore road will not be paved.	Division 10, District 3	2007	Scott Cole	(704)289-1397
Rainfall Estimate Website	Problem: There is a National Pollutant Discharge Elimination System permit requirement to check erosion control devices after a one-half inch or greater rainfall event. Traveling to road construction sites to check conditions after every rainfall event is very time-consuming. There was a need to determine when one-half inch of rainfall has occurred at a highway construction site without having to visit the site. Solution: The Highway Stormwater Program staff worked with the NC Climatic Office to develop a rainfall estimate website that allows users to estimate the rainfall at any road construction site in North Carolina and send an email alert to the user when one-half inch of rainfall has occurred.	Operations - Roadside Environmental	2007	Bob Holman	(919) 861-3779.

Post Ladder / Turner	Problem: As part of sign maintenance, periodically a sign has to be repositioned during installation, or due to wind events or a vehicle accident. In the past, the sign department utilized a post turner to accomplish this task. Utilization of a ladder was also required during this task. Too much time was spent gathering tools and setting up a ladder to perform this task. A new way to minimize the time it takes to reposition a sign or replace a sign without having to get out all the tools and a ladder was needed. Solution: A new post turner was developed that grips the 4 x 4 and incorporates a small steel step welded to the handle that can be used as a step to reach the sign.	Operations - Division 2	2006	Jim Evans	(252) 830-3490
Bolt Breaker	Problem: During the course of day to day operations, traffic services is required to replace or repair road signs due to damage or change in signage. In order to complete these task the employees have to remove the current sign by loosing the nuts which are typically rusty. This is achieved by using a pair of vice-grips. The vice-grips slip off the rusty nut causing employees to readjust the tool resulting in a time consuming process. Solution: A bolt breaker was developed using a 9/16 deep well socket welded to a handle approximately 12 in length to give the user plenty of grip. Once placed over the nut, the 9/16 socket will not slip off and the user does not need to adjust the tool.	Operations - Division 2	2006	Jim Evans	(252) 830-3490
Analytical Instrumentation Update	Problem: The Materials and Tests Unit Chemical Laboratory had an outdated X-ray instrument with which to analyze Portland cement, fly ash, and metal alloys. Analysis of materials that failed the X-ray test were re-tested using traditional wet chemistry methods which were more accurate than the X-ray method, and for which the Chemical Laboratory is accredited by the Cement and Concrete Reference Laboratory (CCRL). This involves handling hazardous solutions and is extremely labor intensive. The old unit was not capable of passing accreditation testing. Solution: Research determined that wavelength dispersive X-ray fluorescence (WDXRF) equipment would pass the stringent requirements of ASTM C-114 Standard Test Methods for Chemical Analysis of Hydraulic Cement. A new unit was purchased and placed in service allowing more accurate tests than with the old instrument and avoiding time consuming wet chemistry methods	Operations - Materials and Tests Unit	2006	Kelly Croft	(919) 329-4090
Adopt-A-Highway Web 3.0 Application	Problem: The Adopt-A-Highway (AAH) program was in need of an upgrade from its legacy mainframe system that would allow the program's 96 AAH coordinators and co-coordinators quick and accurate processing of new applications, as well as producing management reports and labels for more than 6,000 AAH groups. The legacy database was state of the art when it was designed in 1989, but technical support was becoming less available, making it difficult to sustain the integrity of the legacy system. In addition, the AAH program needed an intuitive type database and report system that was easier to learn than the legacy system, which no longer had training classes available. Solution: A Web-based AAH database and report system that integrates the mainframe legacy system and the IVR system was developed, resulting in improved efficiency in the workplace and improved customer service to AAH groups.	Operations - Asset Management	2006	Anne Walker	919-715-2551
Silt Trap Cleanout	Problem: The Materials and Tests Unit has large silt traps installed in the main laboratory that collect fine material (silts, sand, cement, etc.) and prevent the clogging of drains. The traps have to be cleaned once every six months and have traditionally been cleaned by removing the lids or grate, bailing the water out of the trap, and scooping the material out by hand. The cleanout process required four employees working two days to complete. The operation was disruptive to testing processes since laboratory personnel had to work around the crew and could not perform tests that used the drain being cleaned out. Employees were also exposed to whatever bacterial or chemical material had accumulated with the silt in the drain and it posed a slip hazard due to water and silt being dripped across the floors as the material was carried out of the building. Solution: A septic tank pumping service was hired to pump all the silt traps and dispose of the waste material offsite.	Administration - General Services	2006	Mike Cottle	(919) 733-4101
Electronic Transfer of Railroad Crossing Signal PS&E Packages	The Rail Division and railroad companies who are responsible for final engineering and construction of railroad crossing safety projects, have experienced delays of 2 to 4 weeks in delivery of plans, specifications, estimates, and materials lists being forwarded by regular mail. In addition, NCDOT and Norfolk Southern have experienced submittals being lost in the mail, with further time and cost involved in duplicating and resubmitting the packages. A trial transmittal of project documents, including NCDOT plans on aerial photography, was initiated. Norfolk Southern was unable to utilize NCDOT's CADD file formats. The team developed a protocol by which NCDOT's CADD drawings could be transmitted by converting them to JPEG format. Norfolk Southern returns its civil and electrical engineering drawings, materials lists, and cost estimates in PDF format.	Transit - Rail Division	2005	Jason Field	(919) 733-5587

Standard Overhang Falsework Designs	NCDOT requires submittal of plans and calculations for concrete forms for bridge decks, called falsework, to the Structure Design department for approval. Structure Design staff reviews proposed designs for strength, constructability and safety. Especially important is a review of the falsework of bridge deck overhangs which cantilever from the exterior girder. Falsework is subject to the load of the concrete before it hardens and the weight of the screed, a machine that spreads and smoothes the freshly poured concrete to the proper thickness and finish. Due to the many screed types, overhang lengths, concrete thicknesses, exterior girder types, and the proprietary nature of the falsework supports, the designs for overhang falsework are highly variable. Disagreements between DOT and Contractors have often lead to delays and unexpected costs to the Contractor since they are often required to use more substantial falsework than was assumed in the original bid. On large projects this has been a source of substantial litigation.	Preconstruction - Highway Design Branch	2005	Tom Koch	(919) 250-4046.
Fence Line Sprayer	In order to spray unwanted trees and weeds on control of access fences in areas where our spray trucks can not reach, the Division staff has used inmates to manually cut the fence or use back pack sprayers. This is a slow, labor-intensive operation and when you manually cut trees and do not treat the stumps with herbicide the trees will regrow additional stems and not solve the problem.	Operations - Division 7	2005	K.A. Taffer	(336) 334-3192
Salt Brine Trough	Salt Brine operations are still rather new at the State and the current Emergency Response and Procedures Manual does not include Salt Brine calibration instructions. During the last snow / ice storm, our facility utilized the instructions listed in the Draft Skill Based Pay Operations Manual for Snow and Ice to calibrate Salt Brine equipment. These instructions are clearly written in a step-by-step procedure. The instructions call for the tank's feeder hose to be detached from the spray nozzle and spray bar during the calibration procedure and then reassembled once the equipment is calibrated. When our spray bar was damaged and repaired we had to recalibrate the equipment and discovered the feeder hose could not be detached from the spray bar. The CPI team decided that since we could not detach the spray bar from the feeder hose that we should create a trough to hang from the spray bar.	Operations - Division 7	2005	M.S. Venable	(336) 570-6815
The Gate-R	Removal and replacement of Dump Truck tailgates in order to facilitate installation of Sand / Salt In-Body Spreaders when a snow or ice storm threatened was a hazardous work task involving a crew of 5 people and the use of a loader. The task was fraught with unnecessary exposure to pinch points and precarious positioning of personnel. Ankles were strained from slips and falls that were occurring during the process of climbing the vehicle dump body in order to access the tailgate pins. Fingers were frequently pinched during the removal of the safety pins. Overhead lifting techniques were placing personnel in hazardous situations. A loader was needed to perform the operation which tied it up when it could be better utilized to load the trucks with anti-icing material (Sand / Salt). The tailgates were ferried across the yard for storage, which was taking up valuable time and space and causing congestion in the already busy yard. The team designed and built the Gate-R to improve efficiency and reduce risk.	Operations - Division 5	2005	D.J. Viventi	(336) 599-5255.
Pipe Database	In order to plan the maintenance of anything, one must know the quantity of the asset and its condition. It was not known how many crossline pipes exist in our district or their condition. Information was gathered and entered into a database. The database includes a button that looks up the site on topo maps using GPS coordinates that are included in the database. The button provides a location map and environmental assessment of the site. It also allows use of GIS software to view the data. Pictures can also be pulled into the database, allowing one to see the site without having to visit or search through a stack of photos.	Operations- Division 4	2005	F. Enders	(252) 583-5861.
Plan & Permit Review Process	Design plans and / or recommendations from the Roadway Design Unit, the Structure Design Unit, the Geotechnical Unit, Hydraulics Unit, Roadside Environmental, Traffic Control Unit, Utility Sections, Traffic Engineering Branch, and the Division Offices are an integral part of the permit drawings used for the Department's permit application submittal to the U.S. Army Corps of Engineers (USACE), Division of Water Quality (DWQ), and Division of Coastal Management (DCM). In order to improve the accuracy and coordination between the permit drawings and roadway design plans, a revised process is needed that will provide final plans earlier in the process. In other words, there needs to be a time when design changes that occur beyond that point are the extreme and not the norm. To allow this to happen, procedural changes are recommended to the project development process that occur on a project between the public involvement phase until letting. Key groups, i.e. Division, Congestion Management, Utilities, Right of Way, and others, will partner with the Highway Design Branch earlier in the design decision making process.	Preconstruction-Highway Design	2004	Ron Allen	(919)212-5730

Hydro Demolition	A Process was needed to reduce the time need to rehabilitate a bridge deck for a project in Bertie County. The project would take 18 months using standard methods forcing traffic to be detoured for 50 miles during the rehabilitation of the structure. A project in Columbia, SC was using the Hydro-Demolition process for dual three lane structures on I-77. Each structure was approximately 5500 feet long. The Bertie County structure is approximately 1 mile long. Both structures in SC were completed and open to traffic in 25 days. The Bridge Maintenance Unit set up a pilot project using the Hydro-Demolition in Greene County. The Greene County project, using our standard method of deck rehabilitation would have taken 14 weeks. Using Hydro-Demolition, the project was complete and open to traffic within 2 weeks. Using this project on the Bertie County project will reduce the time from 18 months to 30 days.	Operations-Asset Management	2004	Mike Summers	(919)835-8277
Sign Lighting Outline Qualified Product List	Through the use of critical analysis and problem solving, collaboration, and relationship building, the members of the signing electrical squad streamlined a cumbersome and time-consuming process. In the past, contractors were required to submit a description of each proposed sign lighting construction material to the Resident Engineer. This catalog cut submittal was sent to the signing section, researched for compliance with NCDOT specifications, approved, and sent back to the Resident Engineer. Analyzing possible ways to minimize the processing time for catalog cut submittals, the signing section electrical squad learned of web-based tools that could provide a good solution. With help from IT, the signing section electrical squad developed a qualified product list (QPL). The Signing QPL (SQPL) is an online database containing sign lighting materials approved for construction. The development of the SQPL has allowed the signing section to rewrite the policy for submitting catalog cuts.	Preconstruction-Traffic Engineering	2004	Ayman Alqudwah	
E-mailing of Test Reports Between Departments	The processing of grass seed test reports has been made easier and faster with the use of a scanner and e-mail. The Department of Agriculture must certify Grass seeds used by the Department and its contractors before it is used. Grass seed is sampled by either Department of Agriculture inspectors or NCDOT Materials Inspectors and sent to the Department of Agriculture laboratory in Raleigh for testing. Test results are then sent to the Materials & Tests Unit and the Roadside Environmental Unit for evaluation, processing and entry onto the Materials and Tests Unit Web Page. The Department tested 732 lots representing 8,761,392 lbs. of grass seeds in 2003. Previously, the Department of Agriculture laboratory's five page test reports were mailed through the Courier Service which charged $.18 cents per envelope with an average of delivery of five business days. Sometimes the reports did not arrive in a timely manner and usage of the seed on the project was delayed as the seed supplier and contractor had to wait for the test results to be posted by the Materials and Test Unit.	Construction-Materials and Tests	2004	Abby Daniel	(919)733-7091
Automated Open Suspense File	When the Division of Motor Vehicles contacts a vehicle owner by mail, a suspense file is set up. These files are housed on 94 feet of shelving in our Telephone Communication Center. At any given time there are approximately 11,000 files on these shelves. When a phone call concerning a file is received, the file must be pulled from the shelf. It takes about 5 minutes to locate and pull each file and have it available to respond to the caller. There are times when the file is already out to someone else or misfiled, which would add additional time to locate the file. There is one full time file checker and she is assisted by others when needed. After a review of the present system it was decided that the file system should be automated. This would allow review of the file on line.	Division of Motor Vehicles	2004	Richard Howard	(704) 480-5580
Parcel Information Service	DOT offices need address information on property (parcel) ownership for various purposes. This information is valuable for contacting property owners to inform them of citizen information workshops, design public hearings, etc. In the past, DOT offices would send personnel to local tax agencies to gather parcel owner information, or would collect the information directly in the field. These were expensive (travel costs and subsistence) and time-consuming methods of collecting the information. Sometimes different DOT offices would contact a local agency at different times for the same data. That was a source of irritation for the local agency because it demonstrated an uncoordinated effort by DOT offices, and caused the agency to do duplicate work. The GIS Unit developed a service to obtain digital parcel data from local agencies and redistribute the information to DOT offices as needed. Most counties now have parcel data in electronic format. GIS collects data from local agencies through web download or phone ordering. The data is stored and organized into a standard GIS format. The GIS Unit currently possesses 87 (87% of state) county parcel layers.	Information Technology-GIS	2004	Chris Tilley	(919)707-2156

Environmental Permit Process Improvement	The environmental permitting process associated with building and maintaining North Carolina's transportation system is lengthy and highly complex, involving many state and federal agencies. In an effort to improve the workflow effectiveness and efficiency of the environmental permit development, coordination, and issuance process, the NC Department of Transportation (NCDOT), along with the NC Department of Environment and Natural Resources (DENR), and the US Army Corps of Engineers (USACE) jointly sponsored a process improvement initiative. The initiative was initially undertaken with the primary purpose of developing quality permit applications and issuing environmental permits that support the timely delivery of the transportation program while minimizing disruption to the natural and human environment. In North Carolina, the permitting process is integral with the project development and National Environmental Policy Act decision-making process. While the original intent of the initiative was to improve the permitting process, the project development process also had to be examined in order to effect substantive change.	Environment & Planning-Project Development	2004	Debbie Barbour	(919)733-8425
Road Addition Mapping	Recently we have begun to use aerial photography to aid in our road addition process. Previously, when roads were added to the State system we would sketch the road into our county maps and the accuracy was not as it should. With the help of our CAD operators, they can use aerial maps to outline the roads and print out a much more detailed map that gives the exact location, length and reference to other roads.	Operations-Div 10	2004	Matt Weiss	(704) 982-0104
One Man Patcher	After a heavy snow season followed by an unusually wet spring, the roads in the county were in very poor condition with many potholes. We rented a patch machine made by Rossco from Interstate Equipment Co. The machine patches using tar and gravel and is self-contained on a 33,000 GVW truck. The operation requires only one person to operate, and a second if needed to stop traffic when operating in a curve or other blind spots. This operation has patched up to 120 holes in a single day, with 75 to 100 being normal. The single truck was able to patch more holes than all 5 patch crews combined. Each conventional patch crew consisted of 1 TSI, 2 TW, 2 inmates, 1 Crewcab Dump, 1 Tar Kettle, 1 Small Dump, 1 Roller, and 1 Roller Trailer. The use of this machine has not only helped to get potholes under control, but has allowed us to concentrate less on response and more on routine maintenance of roads.	Operations-Div 10	2004	W.D. Gillette	(704) 289-1330
Work Instruction Manual for Office Procedures	The Division 10 Equipment Office clerical staff consists of an office manager and three processing assistants each having designated duties to perform. In the absence of an employee, their designated duties are normally put on hold until they return back to work because other employees are not trained in those areas. Also, if a position becomes vacant, all office personnel brainstorm together to figure out the process to carry on those duties. Since there is no formal training for out specific jobs, we felt the need to cross-train all current personnel and come up with a method to train new personnel as well. Implementing and creating a training/work instruction manual has solved this problem. Office personnel and the equipment superintendent have created a detailed manual to include all transactions that are used to perform day-to-day operations in the Division 10 Equipment Unit.	Operations-Div 10	2004	Anne Evans	(704) 596-2131
Preformed Thermoplastic Detectable Warning (Wheelchair Ramps)	Standard procedure for retrofitting wheelchair ramps for the sight impaired with detectable warning now calls for truncated domes that can be felt underfoot or by canes as the boundary between pedestrian and vehicular routes. There have been issues in the past due to constructability problems with the concrete installation. The standard installation of he truncated domes usually consists of saw cutting and removing concrete. Pour new concrete and stamp with a rubber mat to form the domes, which has not always produced the dome effect. When the domes are not formed as required the process may have to be repeated numerous times. In addition to these possible problems, the concrete mus be allowed to harden before use. By suing preformed thermoplastic, the process consists of cleaning the area and laying an adhesive mat, heating, then rolling of new thermoplastic mat. The process takes around 20-30 minutes.	Operations- Division 7	2004	Bobby Norris	(336) 634-5635
PEF Estimate Database Application By: Traffic Control	Previous PEF application was part of a large database which required users to figure work estimates offline and enter into database. New process uses linked databases to import info from other existing Oracle database and allows for data entry without offline computations (now done by system). New process reduces time involved by 50% and increases accuracy .	PreConstruction	2003	Glenn Dennison	(919)250-4151
Improving the Earthwork Measuring Process	Measuring unclassified excavation was a time consuming process involving photo missions by plane and significant field personnel computations to obtain final measurements. New process process involved several changes - lump sum payments on smaller projects and producing the computation during design and showing on plans. This eliminated template computation by field personnel on all projects and eliminated flights on lump sum projects	Operations PreConstruction	2003	Ellis Powell	(919) 733-2210

Cultural Resources Programmatic Review	NCDOT Cultural Resources Unit and the Roadside Environmental Unit were interested in reducing amount of paperwork, review time and project delays required to obtain State Historic Preservation Office review on Division projects. A need for a more proactive approach was identified. Meetings with the Office of State Archeology, the Historic Preservation Office and the Army Corps of Engineers resulted in a process flow chart and final protocol that required more info early in review process. Utilizing this approach resulted in time saving, labor saving and environmental sustainability.' Time savings of 4,300 hours and labor cost savings of $144,000 were realized.	Environment Planning & Local Government	2003	Robin Little	(919) 715-1757
Improved Litter Trucks	Due to shortage of guards for DOC crews and fewer DOT employees, Alamance Maintenance had a reduction of 63% in its litter patrols. Previous process for picking up litter involved using a pickup truck to haul litter to landfill. Pickup truck had limited capacity and required several trips to landfill. Team looked at options and decided a larger truck with Tommy Lift would reduce labor and trips to landfill. Two person crews can haul more in one load and can remove large appliances easier. Crews can stay in field longer and reduce trips to landfill.	Div 7	2003	Michael Venable	(336) 570-6833
Use of Fully Operated Rental Equipment to Condition SR Roads	Rockingham County had not been able to complete its SecondaryRoad Construction Program due to a number of factors beyond the Control of Henry Adkins, County Maintenance Engineer. In July2001, he was given the task of constructing and paving all roads with right-of-way approval in previous year's programs and the current year (approx. 20 miles) by October 2002. Henry had to develop a method to construct the roads and have them prepared for Road Oil to pave this season while continuing to meet the maintenance needs. Henry met with John Hunsinger, District Engineer, to propose a plan with production as the goal. Three fully-operated rental equipment grade crews constructed as many as five roads at the same time to meet this goal. The volume of work produced so many roads with stone to be conditioned for paving that he switched one fully-operated rental equipment crews from grading to conditioning the roads forpaving in April to allow his grade crew to continue construction with two fully operated rental equipment crews	OPERATIONS - DIVISION 7	2002	Henry Adkins	(336) 634-5642.
IRP Clearinghouse	As a member of the International Registration Plan, there existed a reciprocal agreement between the jurisdictions to collect all monies due from each IRP Registrant for each jurisdiction of travel and disburse them monthly in a timely manner. This process presented several problems: 1) This was a manual process of mailing recaps/ transmittals and checks for payment to all jurisdictions each month, 2) NC did not always receive the monies due from other jurisdictions in the time frame set forth by IRP, Inc., 3) Loss of revenue from the interest on all monies not received in a timely manner, 4) Checks had to be reissued due to being lost in the mail. NC IRP joined the IRP Clearinghouse in July, 2001. Currently 24 jurisdictions participate in the IRP Clearinghouse.	DIVISION OF MOTOR VEHICLES	2002	Lois Warren	(919)861-3503.
Superelevation Calculator	In the design of a roadway with horizontal curves, it is necessary to compute the transition of the roadway edge of pavement elevations to develop superelevation of curves, or banking of curves. The calculations are based on design criteria, which are obtained from the AASHTO Design manual for Highways. Once this data has been decided upon, the project specific calculations can begin. This is where improvements could be made. The calculations are repetitiveand numerous; therefore, the chance of error significant. An Excel spreadsheet was designed to generate superelevation rates at each even increment of superelevation change, as well as each even fifty-foot station. This is accomplished after the data from the AASHTO publication is entered into the specified data fields. Other elements of the spreadsheet alert the designer to the overlap of curves when multiple curves are required. This assures proper spacing of curves for adequate superelevation transition.	OPERATIONS - DIVISION 14	2002	Greg Shuler	(828) 586-2141.
Stockpiling Fill Material at Maintenance Camp	Alamance County Maintenance is responsible for the grading and construction of the Secondary Road Construction Program as well as other duties. One of the on-going duties is the search for and hauling of proper fill material to various projects. During the summer of 2001, DMV was beginning construction on a new facility approx. 1/2 mile from the maintenance Camp. The site they were building on required a large section of cut from the existing grade. The contractor would have to haul the material to an area located a great distance away. It was suggested that he could save both time and money by hauling his material just a short distance to the Maintenance Camp and stockpiling it there at no cost to NCDOT. In return, NCDOT could have a large amount of fill material on-site to be used at the Maintenance Engineer's discretion	OPERATIONS - DIVISION 7	2002	Derek Dixon	(336) 570-6833.

Use of Fully Operated Rental Equipment to Condition SR Roads	Rockingham County had not been able to complete its Secondary Road Construction Program due to a number of factors beyond theControl of Henry Adkins, County Maintenance Engineer. In July 2001, he was given the task of constructing and paving all roads with right-of-way approval in previous year's programs and the current year (approx. 20 miles) by October 2002. Henry had to develop a method to construct the roads and have them prepared for Road Oil to pave this season while continuing to meet the maintenance needs. Henry met with John Hunsinger, District Engineer, to propose a plan with production as the goal. Three fully-operated rental equipment grade crews constructed as many as five roads at the same time to meet this goal. The volume of work produced so many roads with stone to be conditioned for paving that he switched one fully-operated rental equipment crews from grading to conditioning the roads for paving in April to allow his grade crew to continue construction with two fully operated rental equipment crews.	OPERATIONS - DIVISION 7	2002	Henry Adkins	(336) 634-5642.
Flip Detour Signs	Division 10 Traffic Services installs detour signs as needed forconstruction. In the past, the signs were covered until they becameeffective. The problem would occur when weather would blow the covers off in which the sign would then have to be recovered by Traffic Services or the department they were installed for. Other problems occurred when the detour was completed and Traffic Services wasn't informed. Traffic Services developed a sign that flips by installing a hinge in the middle of the sign. This way the sign could be folded up to display the wording or folded down to cover the wording. By using this method, one person could stand on the ground and fold the sign upor down very easily. A latch was used at the top of sign to hold it in place.	OPERATIONS - DIVISION 10	2002	Mike Campbell	(704) 982-0101.
Guardrail Tagging System	With the increase in installation of guardrail and cable guide-rail,comes the increase in rail damage due to vehicle crashes. In order for the State to be compensated for this damage, a responsible party must be identified and billed. Notification of damage is the 1st step. A collision report (DMV-349) is filled out by the law enforcement agency. The reports locate the damaged property in order for an estimate to be prepared. At times, this can be difficult and dangerous due to high-speed roadways with high volume of traffic.The team has developed a tagging system in which the investigating officer tags the damage at time of the crash. The tag is waterproof and secured by flex ties, bright yellow and orange in color, so it can be easily seen by DOH employees. The tag contains the basic information necessary to identify the responsible party. The tag also contains an estimated length of damage which enables DOH to properly begin the billing proess by estimating the repair cost for the billing form (Form 990). Tags can also be located prior to a writtenreport being received and called in to the local county maintenance facility to speed up the billing process and to expedite repairs.	OPERATIONS - DIVISION 4	2002	Debbie Leonard	(252) 237-6164.
Moving Shoulder Reconstruction Operation	Repairing low shoulders after a road was resurfaced was both tohaul in the material and use a grader to level out the dirt, or use a grader mounted disk to pull up existing shoulder dirt. Use of the disk is better if the drop is less than 5", over that would not pull up enough. Equipment used is the grader with a mounted disk, an additional grader to kick off any dirt that is pulled onto the pavement, a broom tractor to sweep the pavement clean, a crew cab gang truck and 2 flaggers. A truck mounted attenuator at the back of the caravan with a "Slow Moving Traffic Ahead" sign and other advanced warning signs was utilized using one less employee. The caravan moves down one side of the road to the end of the workzone, turns around, and comes down the other side. They turn around and go to the next workzone. By this time, the crew leader will have the signs moved and the operation can continue.	OPERATIONS - DIVISION 4	2002	Chris Pendergraph	(919)934-6176.
PM Box	In the past, when a mechanic was to perform a preventive maintenance on a vehicle or equipment, he would go to the parts counter for the needed filters and parts and this could sometimes be time consuming.A new process was implemented to reduce the mechanic's timewaiting for parts. Upon calling the parts department, personnel place the needed filters into a box with the equipment number on it.	OPERATIONS - DIVISION 10	2002	Keith Smith	(704) 596-2131
US Mailbox	The Division 10 Equipment Shop and the District 2 Office/Newell Maintenance facility had separate PO Box rentals. On a daily basis when mail was picked up, each location had mail that belonged to one another delaying that facility in getting mail on time. Due to a busy work schedule, mail was not always picked up in a timely manner and would cause hardships. The post office was the mailing address and mail would be returned to the vendor due to an insufficient address since the Division was not set up to receive mail at the physical address. Also on one occasion, an employee went to pick up the mail and pulled out in flowing traffic and was hit by another vehicle crossing over a railroad track at a very dangerous intersection. Fortunately, the employee was not injured which could have led to thousands of dollars being spent on a workers comp claim.The post office was contacted for details on how to install a US mailbox.	OPERATIONS - DIVISION 10	2002	Anne Evans	(704) 596-2131

Form Letter Application	Refer to an "Index" which listed all forms available for their projects. The users had to look in separate file folders for the letters and procedures. In order to complete the forms, users had to look up all their project information and who the letter should be addressed/ copied to along with their appropriate titles. The Form Letter database was developed that pulls data from a "backend" database that is linked to an NCDOT Oracle database. This allows the user to select their Project TIP number and any other pertinent information if automatically filled in for them. Other features include: 1) Procedures are readily available; 2) An automatic merge function creates a MS Word document allowing further edit; 3) Temporary tables associated with each form; 4) An e-mail feature is included to report problems; 5) A web link is included for easy access to the 12-Month Let List.	PRECONSTRUCTION	2002	Paula Bausch	(919) 250-4151.
Traffic Control Estimate System	The Traffic Control Section is required to provide at least four traffic control estimates for every Transportation Improvement Program (TIP) project in NC. The estimates include scoping, letting list verification, preliminary and final quantity estimate. Each estimate is hand calculated to itemize and document each and every traffic control device that will be used in a specific TIP project. It involves many hours of calculation and the data from these estimates have to be keyed into three separate programs. Other than being inefficient, entering the same data into three separate programs allows for possible inconsistencies between estimate reports on the same project. A consolidated estimate program was created to more efficiently create traffic control estimates.	PRECONSTRUCTION	2001	Jeff Rom	(919) 250-4159
County Maintenance Map Automation	The NCDOT GIS Unit wanted to reduce the long update cycle for county maintenance maps. User's of the county maintenance maps traditionally had a one to two year turnaround time before they were able to view the changes to the state maintained road system. County maintenance maps have been converted to a digital product and are now available for download on the GIS web page.	PLANNING & ENVIRONMENTAL	2001	Terry Norris	(919) 715-3700
Permit Process Improvement Initiative	The environmental permitting process associated with building and maintaining North Carolina's transportation system is lengthy and highly complex, involving many state and federal agencies. The current process takes as many as 10 or more years for a highly complex project. In an effort to improve the workflow effectiveness and efficiency of the environmental permit development, coordination, and issuance process, the NC Department of Transportation (NCDOT), the NC Department of Environment and Natural Resources (DENR), and the US Army Corps of Engineers (COE) are jointly sponsoring a process improvement initiative. The initiative was undertaken with the primary purpose of developing quality permit applications and issuing environmental permits that support the timely delivery of the transportation program while minimizing disruption to the natural and human environment. Recommendations to streamline the project development and permitting process as well as a high level implementation plan and detailed implementation project plans have been developed. A coordination team has been assembled to oversee implementation and facilitate communication and decision making.	PLANNING & ENVIRONMENTAL	2001	Julie Hunkins	(919)508-1852
Qualification Evaluation System	In October of 1997, Senate Bill 886 was passed to ensure qualified persons were hired for State Government positions. The Bill required all State Agencies to recruit and hire applicants based on merit. To ensure that DOT complied with the new law, the Human Resources Department created the Qualification Review Section and implemented the Merit-Based Selection and Recruitment Plan. The Qualification Review Unit set a standard of evaluating all personnel packages within 24-hours. However, storing, compiling, and providing applicant information to applicants, the Legal Department, the General Assembly, OSP, or Employee Relations became a time consuming, tedious process. The Human Resources Department noticed that there was a great demand and need for applicant data and partnered with the Information Technology Section to develop the "Qualification Evaluation System" (QES). The system maintains a database on all applicants that have applied for positions with the Department of Transportation and Division of Motor Vehicles.	HUMAN RESOURCES & INTER-GOVERNMENTAL	2001	Angela Strach	(919) 733-5846

Emergency Meal Reimbursement for Employees	Historically, the department has reimbursed employees $10 for meals (other than lunch) when an employee was on duty for twelve hours or more continuously due to emergency situations involving hurricanes, severe snow storms or other crises. In order to receive this money, EACH employee had to complete an Expense Voucher Form 600-EXP and send it to Fiscal for payment. Processing the large number of expense vouchers involved much time, especially after storms like Hurricane Fran when hundreds of checks were processed. It was not uncommon to still be processing payments four to six months after the event under the old system. Effective November 20, 2000 a new procedure was established for employees to receive emergency pay. Under the new guidelines divisions may reimburse employees for emergency meals through imprest cash. Instead of completing individual expense voucher forms, the division lists all employees eligible for emergency meal reimbursement during a pay period on form ERPM-5. Form ERPM-6 serves as a request for a warrant. The division then processes a check made payable to the supervising engineer, who in turn cashes the check and distributes the money.	FINANCIAL	2001	Brent Hamilton	(919) 733-3624-452
On-Line Expense Voucher System	The manual process of paying expense vouchers was very labor intensive and slow. From the field perspective, forms had to be completed, charges required the correct charge code and had to be added by charge code, all rules had to be remembered and followed, and then all forms and receipts had to be mailed to Fiscal in Raleigh. From Fiscal's perspective, the forms had to be audited for adherence to the rules, charge codes had to be verified, forms had to be re-added, data had to be entered into the warrant system, and then the check, form, and receipts had to be indexed and scanned. This process could take 3 weeks or more to complete. A new on-line expense voucher system was developed to allow direct input of expense voucher information from any computer with mainframe access. 95% of the rules are built into the program so that the user need only enter dates and locations.	FINANCIAL	2001	Brent Hamilton	(919) 733-3624-452
Tackifier Application Efficiency	Seeding crews use CRS-2 asphalt emulsion as a tackifier over the top of grain straw mulch applied on seeding jobs. In the past, truck-towed asphalt kettles of 600 gallon capacity have been used. These units are messy to work with, time consuming to heat if they sit overnight, and must be unhooked from the trucks to be heated. The problem of finding a safe place to drop the kettle, re-heat and wait for a spare or empty truck is compounded by the straw mulch blowing away from the shoulders due to traffic. The lull between the mulch application and the tackifier application results in poor quality work and in loss of time. This reduces the efficiency of the crew in moving on to the next job site. The poor mulch retention along the roadways often requires re-application of both mulch and tackifier in order to protect the shoulder from eroding. Two 1250-gallon asphalt distributors were obtained from the Division 9 Equipment Department when the Division 9 Bituminous Department turned them in. The Equipment Department re-fitted the rear of the units to use a hand spray wand. A pintle hook was attached to the rear of the distributor to enable the crew to carry a mulch blower to the job site as well.	OPERATIONS DIVISION 9	2001	P. H. Suggs	(336) 896-7039
Mulch Application Efficiency	During a review of work processes, crew leaders and personnel indicated a desire to make the mulching operation of their roadside work more efficient. Due to current technology, the application equipment is as efficient as possible. The larger problem is the supply of mulch materials on the job site. A review of the process revealed that the truck payload size required the mulch blower to be hooked to and unhooked from multiple trucks to complete projects. The loading and handling of the trucks proved to be the most time consuming factor in this process. Fewer truck changes would mean more time applying mulch. The team set out to determine the most efficient way to increase the straw mulch payload safely. Utilizing the current trailers to haul straw required too much extra handling. The team discussed putting a pintle hook on the rear of the trailers. This allows the mulch blower to be hooked directly to the trailer. The Division 9 Equipment shop reviewed the request with the Division Safety Officer and outfitted the trailers with the pintle hooks.	OPERATIONS DIVISION 9	2001	J. D. Tucker	(336) 896-7039
Encroachment Computer Program	Processing encroachment agreements in the District office was very time consuming. After the plans were approved, the Assistant District Engineer had to fill out a paper form with all of the information for the agreement, note all of the provisions and carbon copies required, and then log the agreement into a diary. The secretary would type up the agreement, which consisted of a transmittal letter to the Division Office, an agreement contract to the applicant, and usually two pages of provisions. The Assistant District Engineer would then proof the letters and give them to the District Engineer for signature. The processing time for encroachment agreements was usually two weeks. In order to lessen this time an Encroachment Computer Program was created. With this program, the data for the encroachment agreement is logged into a computer and, instead of filling out a paper form, provisions for the agreement are chosen on the computer by the simple click of a mouse button. Then the whole agreement, including the transmittal letter, the agreement contract to the applicant and all provisions, is printed in one step	OPERATIONS DIVISION 4	2001	Chris Pendergraph	(919) 731-7938